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Early Desalinization System

Captain John Foster Williams, Master of the US Revenue Cutter *Massachusetts* developed an early processor for the desalinization of sea water. Florence Kern in her 1976 volume on the history of *Massachusetts* wrote:

FRESH WATER FROM SALT

Whenever the Captain had a day at anchor he and his Second Mate experimented with desalinating salt water, a process he felt would benefit his brethren at sea. He may have been thinking of those long weeks in 1769 when he almost died on the derelict Brig *John* off Bermuda!

He was particularly anxious to make his process so simple that it could be rigged up on any vessel. "No person," he wrote "need ever suffer from want of fresh water at sea because the materials for distillation, except the pot covers, are common to all vessels." The "materials" included an iron tea kettle, a gun barrel, a tub, an iron pot, and a tin sauce pan.

He and Nichols first experimented March 6 and 7, 1792, aboard *Massachusetts* when she was anchored off Rainsford Island. After hailing two outward bound vessels, one a Brig headed

North Carolina and another commanded by their friend, Captain Barnard, they went below decks, put a gallon of salt water into their apparatus and "maid near 3 points [pints] of Very good warter Soft as any Rain water." The next day they did even better. From a gallon of salt water, they made two quarts of fresh.

Williams was elated with his success. On March 8 he sailed to Boston to tell his friends in the Boston Marine Society. Further experiments were made on board April 21-24 in Provincetown. On May 1 he gave a demonstration at a Society meeting and served punch made with the desalinated water. The members found it highly satisfactory. The President then sent directions and a picture of the apparatus to *Massachusetts Magazine*, saying the experiment might be of "public utility", with Williams adding that he hoped it would be of value to his "seafaring brethren" should they be "so unfortunate as to be short of water when at sea".

Published as the leading article in June 1792, it read, in part:

"EXPERIMENTS

To distil fresh water from Salt

March 6, 1792

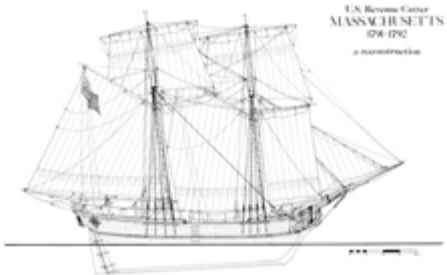
I PUT 4 quarts of salt water in a tin sauce pan, in the stove in the cabin; in 55 minutes I got from it near a quart of good fresh water; one quarter of water left in the sauce pan, the rest was lost. The machine made use of, was a tin crane, with a barrel or cooler made to it of the same, containing about 3 quarts, with a hole in the top, and bottom to put the cold water in I let it out occasionally as it heats. I found that the barrel was not large enough to keep the tube cold. I then put 5 gallons of salt water in an iron pot, made the pot lid tight by putting some old canvas round it -made a hole in the middle to receive the crane- I got from it 2 quarts of good fresh water in one hour and a half; but finding that my cooler was not large enough to keep the crane cool, I left off for that time."

In his April experiments he made further adjustments, and tried distilling fresh water while cooking beef. In this case he found that the water had "a little taste of the beef: and a very small appearance of grease on the top." On another occasion he distilled fresh water while cooking beans.

When Spring came and shipping traffic increased, there was little time for experimentation. In May the Cutter cruised to Nantucket and then to Bath, Maine. In June she went down east again stopping at Chandlers River, Machias, Roque Island, Cranberry Island and ports in the Penobscot. After another cruise to Provincetown, she went back to Bath, boarded a number of vessels in the Kennebec River, and stopped at Cape Ann Harbor (Gloucester) on the way back to Boston .

The Captain's efforts were now directed to increasing the speed and ability of his command but no matter what he did she remained "a very dull sailer".

(Excerpt from Florence Kern. *"To Stand the Trials": The United States Revenue Cutter MASSACHUSETTS, 1791-1792.* (Washington, DC: Alised Enterprises, 1976).

Official Coast Guard Imagery (click on thumbnail for High resolution image)	Caption/ Historical Information
 A detailed line drawing of the USRC Massachusetts, a three-masted sailing cutter. The drawing shows the ship from a three-quarter view, highlighting its complex rigging and hull structure. Text in the upper right corner of the drawing reads: "U.S. Revenue Cutter MASSACHUSETTS 1791-1792 a reconstruction".	Line Drawing of USRC <i>Massachusetts</i>